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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,520	10/28/2003	Amit Singhal	NP303	5392
7590 William L. Botjer PO Box 478 Center Moriches, NY 11934		05/16/2007	EXAMINER NGUYEN, TRI V	
			ART UNIT 1751	PAPER NUMBER
			MAIL DATE 05/16/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/695,520

Applicant(s)

SINGHAL ET AL.

Examiner

Tri V. Nguyen

Art Unit

1751

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 15-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Group I, claims 1-14, in the reply filed on 04/20/2007 is acknowledged. The traversal is on the ground(s) that the inventions of Groups I-III have are sufficiently similar. This is not found persuasive because the inventions of Groups I-III require different search strategies due to the differing and distinctive ingredients such as a secondary metal component and the carbon composite thus leading to a serious burden on the examiner.

The requirement is still deemed proper and is therefore made FINAL.

### ***Priority***

2. The examiner has determined that the instant claims are accorded the priority date of 10/28/2003 (the filing date of the instant application).

### ***Claim Objections***

Claims 1 is objected to because of the following informalities: a minor typographical error ("a anti" in line 4 should be "an anti"). Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claim 1 recites the limitation "the solids" in line 12. There is insufficient antecedent basis for this limitation in the claim.

Claims 2-14 are dependent on claim 1 thus inherit the same deficiency.

The examiner also notes the discrepancies in referring to "the solids" (claim 1), "the dried solid" (claim 11) and "the solid" (claim 12).

In claim 3, it is unclear as to the claim limitation of the primary and secondary (nano)particle. There is insufficient antecedent basis for this limitation in the claim.

Furthermore, is "(aggregate)" part of the claim limitation?

Claim 13 recites the limitation "the calcined  $\text{LiFe}_x\text{M}_{1-x}\text{PO}_4$  powder" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 is dependent on claim 13 thus inherits the same deficiency.

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

#### ***Claim Rejections - 35 USC § 102 & 103***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-6 and 9-14 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Armand et al (WO 02/27824 -- US equivalent 2004/0086445).

Armand et al. disclose a synthesis method of an olivine structured  $\text{LiFeMnPO}_4$  and  $\text{LiFePO}_4$  in which iron, lithium, phosphate and optionally manganese precursors and a sugar (the anti-agglomeration component) are homogenously mixed in a solvent, the solvent is evaporated, the material is dried and is heated to less than  $900^\circ\text{C}$  for less than 5 hours in an inert atmosphere (see at least abstract, parag. 31-37, 52, 61-75 and examples 3 and 10). The examiner remarks that components a-d in claim 1 and the heating in claim 1 are construed as not necessarily being separate for example the lithium salt and metal salt compounds being the same ingredient and the heating step being a continuous extension of the staggered heating (see examples 3 and 10). Various iron precursors such as iron oxide, iron phosphate, iron sulfate and iron hydroxide are disclosed in parag. 45. Various lithium components such as lithium hydroxide, lithium carbonate and lithium acetates are disclosed in para. 46 and 97. Various phosphate components such as ammonium hydrogen phosphate and ammonium phosphate are disclosed in parag. 47 and 98. The limitation of iron hydroxide coated with an anti agglomeration is met as Armand et al. teach the starting particles being coated with the sugar such as glucose and cellulose (parag. 79 and 81). Armand et al. further teach that the starting particles have a particle size of less than 5 micrometers (parag. 41).

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The reference is anticipatory.

In the alternative that the above disclosure is insufficient to anticipate the above listed claims such as selection of a particular ingredient, it would have nonetheless been obvious to the skilled artisan to achieve the synthesis methodology, as the reference teaches each of the claimed ingredients within the claimed proportions for the same utility and such modifications are well within the purview of the skilled artisan.

7. Claims 7-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Armand et al (WO 02/27824 -- US equivalent 2004/0086445 is cited hereon) in view of Chiang et al. (US 2004/0005265).

Armand et al. disclose the invention of claim 1 but do not explicitly disclose comprising the experimental conditions in the ranges as those recited by the Applicant and the Co, Ni and V components.

In an analogous art, Chiang et al. disclose a method of producing an olivine  $\text{LiM}'\text{M}''\text{PO}_4$  with  $\text{M}'$  and  $\text{M}''$  being Fe, Mn, Co, Ni and V via a co-precipitation from liquid solvent method in which the metal, lithium, phosphate precursors are mixed in a solvent, dried at a temperature not exceeding  $100^\circ\text{C}$  followed by a two-steps heat treatment in an inert atmosphere (see parag. 62, 68, 69, 83, 90, 126 and table 3). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method as taught by Armand et al. One would have been motivated to enhance the synthesis product quality and yield and increase electrochemical performance of the resulting material since each dopant leads to a different conductivity.

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**Conclusion**

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Yamada et al. "Optimized LiFePO<sub>4</sub> for lithium battery cathode" Journal of Electrochemical Society, 148 (3) A224-229 (2001).

b. Chung et al. "Electronically conductive phosphor-olivines as lithium storage electrodes." Nature, vol 11, October 2002.

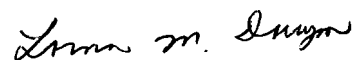
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tri V. Nguyen whose telephone number is (571) 272-6965. The examiner can normally be reached on M-F 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on (571) 272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NVT

NVT, PhD  
May 14, 2007

  
**LORNA M. DOUYON**  
**PRIMARY EXAMINER**